

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
January 25, 1961

EXAMINER HEARING

IN THE MATTER OF:

Application of Pan American Petroleum Corporation for two unorthodox oil well locations and a non-standard oil proration unit. Applicant, in the above-styled cause, seeks approval of two unorthodox oil well locations in the Cha Cha-Gallup Oil Pool, San Juan County, New Mexico, said locations to be as follows:

Case
2165

From Navajo Tribal "E" Well No. 7, to be located 250 feet from the South line and 800 feet from the West line of Section 16.

Navajo Tribal "G" Well No. 5, to be located 1830 feet from the South line and 885 feet from the East line of Section 18, both in Township 29 North, Range 14 West.

Applicant also seeks an 88.7-acre non-standard oil proration unit in said pool comprising that portion of the SW/4 of Section 16, within the Navajo Reservation lying South of the mid-channel of the San Juan River, Township 29 North, Range 14 West, to be dedicated to said Navajo Tribal "E" Well No. 7.

BEFORE:

Elvin A. Utz, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: 2165.

MR. PAYNE: Application of Pan American Petroleum Corporation for two unorthodox oil well locations and a non-standard oil proration unit.

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MR. BUELL: May it please the Examiner, we have one witness, Mr. Eaton.

(Witness sworn.)

MR. UTZ: Other appearances in this case? Proceed.

GEORGE W. EATON, JR.

called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. BUELL:

Q Mr. Eaton, will you state your complete name, please, by whom you are employed, in what capacity and in what location?

A George W. Eaton, Jr., Senior Petroleum Engineer for Pan American Petroleum Corporation, in Farmington, New Mexico.

Q You have testified at a prior Commission hearing, have you not?

A Yes, I have.

Q And your qualifications as a petroleum engineer are a matter of public record, are they not?

A Yes, sir, they are.

MR. UTZ: His qualifications are acceptable.

Q (By Mr. Buell) I direct your attention now, Mr. Eaton, to what has been marked as Pan American's Exhibit No. 1. What does that exhibit reflect?

A Our Exhibit No. 1 is a map of the northwest portion of the Cha Cha Gallup oil pool in San Juan County, New Mexico.

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Q What data are reflected on that exhibit with respect to the Cha Cha-Gallup reservoir itself?

A The lines on Exhibit No. 1 are isopachs of the net Gallup thickness in the northwest portion of the Cha Cha-Gallup Pool.

Q What is your contour interval there?

A The contour interval is two feet.

Q Are the regular Cha Cha wells just shown with the conventional blue dot?

A Yes, sir. The Cha Cha wells are shown with the conventional blue dot. The two large green dots in the northwest portion of the contoured area are the two unorthodox locations which are the subject of this hearing.

Q Which one of those would you prefer to discuss first, Mr. Eaton?

A The location for Navajo "G" No. 5, which is located in the southeast quarter of Section 18, Township 29 North, Range 14 West.

Q Would you locate that well specifically with relation to distances from line?

A That location is 1830 feet from the south line and 885 feet from the east line of Section 18.

Q Why is it unorthodox?

A It is unorthodox because the distance from the east line is 885 feet. The orthodox location would be no more than 810 feet from the east line.

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Q I direct your attention now to what has been marked as Pan American's Exhibit No. 2. What does that exhibit reflect?

A Exhibit No. 2 is a copy of Form C-128, which is acreage dedication plat and well location for the Navajo "G" No. 5 location.

Q Looking at that unit which Pan American proposes to assign to this well, and particularly to the north half of that unit, is it physically possible to make an orthodox location there, Mr. Eaton?

A Yes, sir. It would be physically possible to do so, but it would be highly impractical to do so.

Q Why would it be impractical?

A You will note that the regular location in the north half of the unit would fall immediately on the bank of what has been labelled "flow channel of the San Juan River." You will also note that immediately north of the well location there is a structure called "beaver dam."

Q Is that the name of the dam, or is it a dam made by beavers?

A It is a dam made by beavers.

Q What have those beavers done there to affect an orthodox location?

A The fact that that dam is across that portion of the flow channel has resulted in water backing up behind that dam and it is quite a deep cut down to the water level, with the body of the water being some 20, 30 feet in width.

Q ~~The terrain features that are reflected on Exhibit No. 2,~~

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did you draw those terrain features on there, yourself, Mr. Eaton?

A No, sir. Those features were drawn on by the surveyor.

Q Did you make an on-the-ground survey of this area, all the area covered by this application, yourself?

A Yes, sir. I went out and made a visual observation of the location and I found that the map or plat drawn by the surveyor accurately describes the conditions that prevail.

Q Let's move to the south half of that unit, Mr. Eaton. Could you make an orthodox location there?

A Yes, sir, it would be possible to make an orthodox location in the south part of that unit, although I would like to point out this, there are some Indian dwellings in the south part of that south half of the unit.

Q Other than the dwellings that might be on the south half, is there any reason, from a reservoir standpoint, that you, as a reservoir engineer, would not recommend a location in the southern half of the unit?

A As a reservoir engineer my recommendation was to drill the Navajo "G" 5 in the north half of that unit simply from the standpoint of providing an orderly and uniform development pattern. You will note that --

Q You are going back to Exhibit 1 now?

A Yes, sir. You will note from Exhibit 1 that there is a well known as the Pan American Navajo "G" No. 4 located in the southwest southwest of Section 17. Now, a well drilled in the



southeast southeast of Section 18 would be an immediate offset to that existing well, so from the standpoint of providing a uniform development pattern in this area it was my recommendation that the well be drilled in the north half of that unit.

Q Are you of the opinion that the 80 acres that Pan American proposes to attribute to that well, in your opinion, is each and every acre of that 80 productive?

A It is my opinion that the entire 80 acres is productive from the Cha Cha-Gallup Pool.

Q It would seem to me, Mr. Eaton, just looking at your plat there and where that well is located in the northwestern portion of that unit, if that well is a producer, it seems pretty conclusive to me, looking at it, that all would be productive?

A That is my opinion too. If that well is a producer from the Cha Cha-Gallup Pool, then the entire unit is definitely productive.

Q Let's go to the other unorthodox location, Navajo "E" 7. Would you locate that well for the record?

A The location for the Navajo "E" 7 is 250 feet from the south line and 800 feet from the west line of Section 16, Township 20 North, Range 14 West.

Q Why is that location unorthodox?

A That location is unorthodox because it is located only 250 feet from the south line of that section. To be orthodox it would have to be located at least 510 feet from the south line.

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Q I direct your attention to what has been marked Pan American's Exhibit 3. What does that particular Exhibit 3 reflect?

A Exhibit No. 3 is a copy of NMOCC Form C-128 showing the acreage dedication and the well location for Navajo "E" No. 7.

Q Mr. Eaton, would it be physically possible to make an orthodox location in the western half of this unit?

A It would be physically possible to do so, but, again, it would be highly impractical.

Q Why would it be impractical, Mr. Eaton?

A It would be impractical to do so because of the terrain features existing in the northern part of the west half of that proposed unit.

Q Would you briefly point out what those terrain difficulties are?

A Referring you again to Exhibit 3 you will note immediately north of the proposed location there is a feature called "drainage canal." Immediately north of that is marsh land, overgrown with sage brush and at the time I was out there, a good part of this was covered with ice and snow.

Q Did it appear to you that was probably the flood plain of the San Juan River?

A Yes. The flood plain of the San Juan River in this particular area is quite large. You can tell that in time of high water, spring run-offs, the river actually occupies a considerably wider area than it does during times like now, where run-off is really

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low, and there is not much water flowing down that river channel.

Q Did you, yourself, draw these terrain features on Exhibit 3?

A No. These terrain features were drawn by the surveyor. However, I did make a visual observation on the ground and on the basis of that observation I believe that the map accurately reflects the condition that prevailed around this location.

Q That drainage canal depicted on Exhibit 3 appears to be very straight and uniform, Mr. Eaton. Did that appear to you to be man-made?

A It appeared to me to be a man-made canal, possibly used for irrigation purposes. Of course, at the time I was out there it was partly filled with snow and what little water was in it was hard and frozen. It did not appear to be in use right at the present time.

Q You wouldn't be irrigating in San Juan County at this time of year, would you?

A No, sir.

Q It did appear to you that the Indians were using that for drainage purposes or irrigation purposes?

A It appeared to be a canal that was in use at least during portions of each year.

Q Let's go now to the east half of that unit. Could you physically make an orthodox location there?

A Yes, sir, it would be possible to make an orthodox location

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in the east half of that unit. However, again, as in the case of the Navajo "G" No. 5, and referring again to our Exhibit No. 1, you can see that to follow the uniform development pattern which exists in this immediate area the location should actually be placed in the west half.

Q Do you have anything else to say with respect to the unorthodox location of Navajo "E" No. 7?

A I believe not.

Q Let's go on, then, to the other phase, rather, the last phase of this hearing, the request for a non-standard proration unit which we propose to assign to the Navajo "E" No. 7. Let me direct your attention to what has been marked Exhibit No. 4. What does it reflect, Mr. Eaton?

A Exhibit No. 4 is a plat of that portion of the Navajo "E" lease lying in Section 16, Township 29 North, Range 14 West.

Q Would you describe the proposed non-standard proration unit that we are asking authority to form?

A The proposed non-standard proration unit is outlined on Exhibit No. 4 by the red line. It would consist of the Lot No. 4 in the southwest southwest Section 16, containing 32.30 acres, and that portion of the Navajo Reservation lying in the south half of the San Juan River Channel immediately to the North of Lot 4, containing 6.94 acres; Lot 5 of Section 16, containing 44.75 acres, and that portion of the Navajo Reservation lying in the south half of the San Juan River Channel containing 4.78 acres, lying imme-



diately north of Lot 5. The total acreage in the non-standard unit is 88.77 acres.

Q Would this be a non-standard unit, not only due to size but also to shape, Mr. Eaton?

A Yes, sir, it would be.

Q I wonder, Mr. Eaton, in looking at this acreage in this northern end of the Navajo Reservation, and particularly the combination of parcels that we have in this proposed unit, could you visualize how it could be possible, or if it would be possible, to use any combinations of these parcels and form a standard unit?

A No, sir, it would not be.

Q Do you feel that the recommended unit, as reflected on your Exhibit 4, is a sound and practical solution to this problem that we have here?

A I believe that our recommended non-standard unit is a practical solution to this rather unique situation. It is unique because of the irregular boundary on the north side of the Navajo Indian reservation.

Q Do you feel that all the acreage contained within this proposed unit is productive from the Cha Cha-Gallup Pool?

A Yes, sir. I do believe that it is all productive, and that the evidence that it is productive was shown by Exhibit 1.

Q In your opinion, as a reservoir engineer, Mr. Eaton, if a well in a reservoir will drain 80 acres, would you feel that it would also drain 88.77?

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A I would have no fear that the remaining 8.77 acres would not be drained.

Q When you analyze all three phases of this hearing, the two unorthodox locations as well as the non-standard unit, do you feel that if the Commission should approve these requests that it will serve conservation as well as protect the correlative rights of all owners of interests?

A Yes, sir, I do.

Q Do you have anything else you would like to add?

A No, sir, I don't believe so.

MR. BUELL: That is all we have, Mr. Examiner, at this time.

MR. UTZ: Do you want to offer your exhibits at this time?

MR. BUELL: May I formally offer Pan American's Exhibits 1 through 4?

MR. UTZ: Without objection Pan American's Exhibits 1 through 4 will be entered into the record in this case.

BY MR. UTZ:

Q Mr. Eaton, these are contours on the top of the Gallup zone?

A They are contours on the net sand thickness.

Q They are isopachs, then?

A Isopachs, yes, sir.

Q So the zero isopach just barely cuts the corner of your unit in Section 18, right?

A Yes, sir. I might add this, the zero sand thickness does



not necessarily mean that that is also the productive limits. As you know, the Gallup consists of sand, sandy shales and shaly sand, and this map correctly, I believe, reflects that clean sand, but it would be possible, as in many other areas, to make a producing Gallup well out of one of these shaly sands or sandy shale members. I am convinced the entire 80 acres in Section 18 is productive from the Cha Cha-Gallup Pool.

Q I was going to ask you what control have you got for your zero contour?

A We actually do not have any well in the Cha Cha-Gallup Pool which has zero sand in it, so for that portion of the isopach on the southwest flank below six feet is simply extrapolation. Excuse me, four feet. There is the Navajo "G" No. 4, located in the southwest southwest section of 17 which only had four feet, so the two foot and the zero line are extrapolations. On the north side, northeast side of the field the two foot and the zero foot are also extrapolations.

Q And this doesn't represent that shaly productive portion of the pool?

A No, sir. This only represents the clean sand.

Q You are asking for this location to be 175 feet off of the standard location in the north half of this unit?

A Yes, sir; that's correct.

Q In view of your drainage pattern, it would be better to be 175 feet off center, or off from the standard unit, rather than

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to move to the south end of the unit or conduct offshore operations in the beaver pond?

A Yes, sir.

Q In the interests of a consistent spacing pattern?

A Yes, sir.

Q You believe you will recover more oil by spacing in this manner?

A Let me say this: It is my opinion that this pool, like a number of the other Gallup pools, will be subjected to secondary recovery operations, and in secondary recovery operations it might be far more important to have uniform pattern for injection purposes than it would be for primary production. I am looking down the road to that extent.

Q And the same question and the same answers in regard to your non-standard location in Section 16 would hold true?

A Yes, sir.

Q Now, in regard to your non-standard unit, what is your survey source for your 4.78 and your 6.94 acres on the north edge of these two 40-acre plats?

A This plat shown in Exhibit No. 4 was drawn by Pan American's Title Survey Department from a public land survey conducted and accepted by the appropriate bodies in 1882, accepted by the General Land Office in 1882. While I am not sure how those acreages were determined I feel sure that it was by differences. In other words, this is a regular section. The Lots 2, 3, 4 and 5 are

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areages described by that public land survey. By differences it can be determined how much acreage lies in the channel of the San Juan River, and description of the Navajo lease describes it as existing to the mid-channel of the San Juan River.

Q In other words, they don't give you the acreage that is in the channel; they give you the acreage on both sides of it, and you arrive at the channel acreage by dividing that acreage in half?

A The public land survey simply gives the acreage in the lots, yes, sir, and I feel sure that our Title Survey Department determined acreage in the river channel by differences. I really don't know.

Q Mr. Eaton, you are aware that under the Cha Cha-Gallup rules you can drill on either 40 of the 80-acre unit?

A Yes, sir.

Q Actually, your application is not, in reality, based on topography as much for the non-standard locations, inasmuch as you can drill a standard location?

A That is true. In each case we could drill a standard location. It would simply not follow the uniformity of development.

Q As to your well in Section 18, is your application to any extent there based on structure?

A No, sir.

Q In other words, you feel you get just as good a well from the south end of the 80 as the north end?

A It is my opinion it would be a better location in the south end.



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Q You are getting closer to the zero contour line?

A Yes, sir; also getting closer to an existing well. It would be a safer location, let me put it that way. You see, that contour is all extrapolated to the northwest there, and it is a shorter extrapolation to a location in the south half of the unit than it is to the north half so, for that reason, I believe the location in the south half actually would be probably safer.

Q Referring to your other unit, Section 16, and your proposed well there. Is your proposed location closer to that existing well, or would it be closer on a standard location in the east half of that 80?

A It doesn't appear to be too much different. I will scale it off.

Q Do you own the lease on the north side of that river? Is that a flow channel, or is that a river bed the beaver pond is in?

A It is a flow channel.

Q Side channel?

A Yes, sir. Its size, in comparison to the river bed, is small, to the regular flow channel of the river, but there is water flowing down it. It has the appearance of being a permanent, not an intermittent, flow channel, but a permanent flow channel.

BY MR. PAYNE:

Q Did you scale that off, Mr. Eaton?

A Yes, sir. There is no appreciable difference, maybe a hundred feet closer to regular location in the east half of the non-



standard unit, but I would say no appreciable difference.

Q Does Pan American control the acreage in Section 21?

A Yes, sir.

Q So you are not crowding anybody but yourself with that well?

A That's right. As a matter of fact, Section 21 and the Navajo acreage in Section 16 are one and the same common lease, royalty and working interests are all the same.

MR. PAYNE: Thank you.

MR. UTZ: Any other questions?

BY MR. NUTTER:

Q Mr. Eaton, it is my understanding that the Navajo Tribal Council is, at the present time, and has for sometime in the past, been conducting surveys of the Reservation. In the event the survey of this north boundary of the Reservation would show the acreage which is being applied for to be attributed to this well in Section 16 is not correct, Pan American would be willing to have this acreage adjusted; is that correct?

A Yes, sir.

MR. UTZ: Any other questions?

MR. BUELL: I have one.

REDIRECT EXAMINATION

BY MR. BUELL:

Q Mr. Eaton, did I understand you to say, or what you said led me to believe or put this interpretation on it, in developing this Cha Cha Callup Field not a single dry hole has been drilled?



A That is correct.

Q Isn't that rather unique in your experience?

A Yes. Usually the fields are defined by dry holes. In this particular case none have been drilled yet.

MR. UTZ: Witness may be excused. Any statements in this case? Case will be taken under advisement. Hearing adjourned to 1:30.

(Whereupon the hearing was adjourned until 1:30 P.M.)

STATE OF NEW MEXICO)
)
COUNTY OF BERNALILLO) ss

I, JUNE PAIGE, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 1st day of February, 1961.


Notary Public - Court Reporter

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I N D E XWITNESSPAGE

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E X H I B I T S

<u>NUMBER</u>	<u>EXHIBIT</u>	<u>IDENTIFIED</u>	<u>OFFERED</u>	<u>ADMITTED</u>
Ex.#1	Map	2	11	11
Ex.#2	Form C-128	4	11	11
Ex.#3	Form C-128	7	11	11
Ex.#4	Plat	9	11	11

I do hereby certify that the foregoing is
a complete record of the proceedings in
the Examiner hearing of case No. 2165
heard by me on Jan. 25, 1964.

[Signature]
Examiner
New Mexico Oil Conservation Commission

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